General Electric Advanced Technology Manual

Chapter 4.14

Reportability

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4.14 REGULATORY OVERSIGHT PROCESS

Learning Objectives

1. Recognize the purpose for reporting events under 10 CFR 50.72 and 10 CFR 50.73.

2. Identify the five types of reports required under 10 CFR 50.72.

3. Recognize when the reporting time requirements start for immediate notifications and when the time starts for licensee event reports.

4. Recognize the preferred method for making immediate notifications, alternate methods for making the reports and who receives the reports.

5. Recognize when ERDS is required to be initiated.

6. Distinguish between a valid and an invalid actuation of RPS and ESF systems.

7. Recognize the general subject of reports made under:

    - 10 CFR Part 20, Part 21, Part 26, Part 72 and Part 73
    - 10 CFR 50.9, 10 CFR 50.36 and 10 CFR 50.46

4.14.1 Purpose

The purpose of the requiring licensees to report certain events is to help fulfill the NRC mission by aiding emergency response and providing feedback of operating experience into plant operations. These are achieved partly by the licensee event reporting requirements of Title 10 of the *Code of Federal Regulations*, Part 50, Sections 50.72 and 50.73 (10 CFR 50.72 and 50.73). Section 50.72 provides for immediate notification requirements via the emergency notification system (ENS) and Section 50.73 provides for 60-day written licensee event reports (LERs). Other regulations require event reporting including Standards for Protection Against Radiation (10 CFR Part 20), Reporting Defects and Non-Compliances (Part 21), Fitness for Duty Programs (10 CFR Part 26), Completeness and Accuracy of Information (10CFR50.9), Technical Specifications (10CFR50.36), Acceptance Criteria for ECCS (10CFR50.46), Licensing Requirements for ISFSI (10 CFR Part 72) and Physical Protection of Plants and Materials (10 CFR Part 73).

The information reported under 10 CFR 50.72 and 50.73 is used by the NRC staff in responding to emergencies, monitoring ongoing events, confirming licensing bases, studying potentially generic safety problems, assessing trends and patterns of

operational experience, monitoring performance, identifying precursors of more significant events, and providing operational experience to the industry.

4.14.2 Overview

Each licensee must send information to NRC about certain "reportable events" that occur at their facility or during their use of nuclear materials. The NRC has issued NUREG-1022, Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73, to provide detailed guidance on what to report and how, for those events listed in the regulation.

The objectives of these rules are:

(1) To align the reporting requirements with the NRC's current reporting needs for information to carry out its safety mission.

(2) To reduce the unnecessary reporting burden, consistent with the NRC's reporting needs associated with events of little or no safety significance.

4.14.2.1 Immediate Notification Requirements for Operating Nuclear Power Plant (10CFR50.72

The essential safety purposes for immediate reports made under 10 CFR 50.72 are to provide for immediate reporting of significant events where: (1) immediate NRC action may be required to protect the public health and safety, or (2) the NRC needs timely, accurate information to respond to heightened public concern. These reports are made to the Headquarters Operations Officer (HOO) using the Emergency Notification System. Reports range from immediate notifications of emergencies to non-emergency reports required to be made within a specified time frame (i.e., one-hour, four-hour or eight-hour reports).

The vast majority of event reports do not require activation of our incident response program. However, the NRC emergency preparedness programs enable emergency personnel to rapidly identify, evaluate, and react to a wide spectrum of emergencies, including those arising from terrorism or natural events such as hurricanes. The incident response program integrates the overall NRC capabilities for the response and recovery of radiological incidents and emergencies involving facilities and materials regulated by the NRC or an Agreement State. Under the National Response Framework, the NRC will coordinate with other Federal, State, and local emergency organizations in response to various types of domestic events. The NRC emphasizes the integration of safety, security, and emergency preparedness as the basis for the NRC's primary mission of protecting public health and safety.

4.14.2.2 Licensee Event Reports (10CFR50.73

The essential safety purpose of licensee event reports required by 10 CFR 50.73 is to identify the types of events and problems believed to be significant and useful to the NRC's effort to identify and resolve threats to public health and safety. It is designed to provide information needed for engineering studies of anomalies, trend analysis of occurrences, and identification of accident precursors. This enables the NRC to determine whether further action is needed to maintain or improve reactor safety.

Licensee Event Reports (LERs) are detailed reports submitted to NRC within 60 days of a plant abnormality in accordance with 10 CFR 50.73. These reports contain root causes and corrective actions undertaken by licensees. The reported events are reviewed at NRC Headquarters by a group of technical experts using plant specific risk insights and operating experience to identify significant weaknesses in plant design, operation, or equipment. Some plant abnormalities that are not of a significant nature are reported only through LERs. When problem areas are identified, the NRC coordinates the appropriate level of inspections with the regional offices to reach a satisfactory resolution. In certain cases, these reported events are addressed through generic communications to the industry and other interested or potentially affected parties and are made available to the public through the NRC’s public web site. The reports that address a major deficiency in design or construction, major degradation of essential safety-related equipment, or moderate release or exposure to radioactive material are forwarded to the NRC Office of Research for inclusion in the annual Report to Congress on Abnormal Occurrences.

4.14.2.3 Emergency Notification System (ENS)

Each commercial nuclear power reactor facility has ENS telephones. These telephones are located in each licensee's control room, technical support center (TSC), and emergency operations facility (EOF). A separate ENS line is installed at EOFs which are not onsite. The ENS is part of the Federal Telecommunications System (FTS) and provides a direct link from the utility to the Headquarters Operations Officer in the NRC Operations Center.

If the Emergency Notification System is inoperative, the licensee shall make the required notifications via commercial telephone service, other dedicated telephone system, or any other method which will ensure that a report is made as soon as practical to the NRC Operations Center. Typically, each utility will have multiple means of communication and their emergency response plan will establish the priority that each is used. These alternate means of communication may include commercial phone lines, cellular phones, satellite phones and/or radio links to other facilities where communications can be relayed to the NRC Operations Center.

The NRC Operations Center is the nucleus of the ENS and has the capability to handle emergency communication needs. The NRC's response to both emergencies and non-emergencies is coordinated in this communication center. The key NRC emergency communications personnel, the emergency officer (EO), regional duty officer (RDO), and the headquarters operations officer (HOO), are trained to notify appropriate NRC personnel and to focus appropriate NRC management attention on any significant event.

The NRC records all conversations with the NRC Operations Center. The tape is saved for a month in case there is a public or private inquiry. During an emergency the NRC may request the licensee to remain on the phone for improved communication.

At the time of an ENS notification, the NRC must independently assess the status of the reactor to determine if it is in a safe condition and expected to remain so. The HOO needs to understand the safety significance of each event to brief NRC management or initiate an NRC response. The HOO will be primarily concerned about the safety significance of the event, the current condition of the plant, and the possible near-term effects the event could have on plant safety. The HOO will attempt to obtain as complete a description as possible at the time of the notification of the event or condition, its causes, and its effects

The licensee's first responsibility during a transient is to stabilize the plant and keep it safe. However, licensees should not delay declaring an emergency class when conditions warrant because delaying the declaration can defeat the appropriate response to an emergency. Because of the safety significance of a declared emergency, time is of the essence. The NRC needs to become aware of the situation as soon as practical to activate the NRC Operations Center and the appropriate NRC regional incident response center, as necessary, and to notify other Federal agencies.

The effectiveness of the NRC response during an event depends largely on complete and accurate reporting from the licensee. During an emergency, the appropriate regional incident response center and the NRC Operations Center become focal points for NRC action. Licensee actions during an emergency are monitored by the NRC to ensure that appropriate action is being taken to protect the health and safety of the public. When required, the NRC supports the licensee with technical analysis and coordinates logistics support. The NRC keeps other Federal agencies informed of the status of an incident and provides information to the media. In addition, the NRC assesses and, if necessary, confirms the appropriateness of actions recommended by the licensee to local and State authorities.

It is the licensee's responsibility to ensure that adequate personnel, knowledge about plant conditions and emergency plan implementing procedures, are available on shift

to assist the shift supervisor to classify an emergency and activate the emergency plan, including making appropriate notifications, without interfering with plant operation. When 10 CFR 50.72 was published, the NRC made clear its intent in the Statements of Consideration that notifications on the ENS to the NRC Operations Center should be made by those knowledgeable of the event. If the description of any emergency is to be sufficiently accurate and timely to meet the intent of the NRC's regulations, the personnel responsible for notification must be properly trained and sufficiently knowledgeable of the event to report it correctly.

4.14.2.4 Emergency Response Data System (ERDS)

The Emergency Response Data System (ERDS) is a direct near real-time electronic data link between the licensee's onsite computer system and the NRC Operations Center that provides for the automated transmission of a limited data set of selected parameters. The ERDS supplements the existing voice transmission over the Emergency Notification System (ENS) by providing the NRC Operations Center with timely and accurate updates of a limited set of parameters from the licensee's installed onsite computer system in the event of an emergency.

ERDS is required as part of each licensee’s Emergency Response Plan (10 CFR 50, Appendix E) and is required to be activated within one hour of declaring an Alert emergency declaration or above (10 CFR 50.72).

The Commission has defined the NRC's primary role in an emergency at a licensed nuclear facility as one of monitoring the licensee to assure that appropriate recommendations are made with respect to offsite protective actions. Other aspects of the NRC’s role include supporting the licensee with technical analysis and logistic support, supporting offsite authorities, including confirming the licensee's recommendations to offsite authorities, keeping other Federal agencies and entities informed of the status of the incident, and keeping the media informed of the NRC's knowledge of the status of the incident.

To fulfill the NRC's role, the NRC requires accurate, timely data on four types of parameters: (1) core and coolant system conditions must be known well enough to assess the extent or likelihood of core damage; (2) conditions inside the containment building must be known well enough to assess its status; (3) radioactivity release rates must be available promptly to assess the immediacy and degree of public danger by these pathways; and (4) the data from the plant's meteorological tower is necessary to provide insight into the potential distribution of a release.

For boiling water reactors (BWRs), the selected parameters are: (1) Reactor coolant system: Reactor pressure, reactor vessel level, feedwater flow, and reactor power; (2) Safety injection: Reactor core isolation cooling flow, high-pressure coolant

injection/high-pressure core spray flow, core spray flow, low-pressure coolant injection flow, and condensate storage tank level; (3) Containment: drywell pressure, drywell temperatures, drywell sump levels, hydrogen and oxygen concentrations, suppression pool temperature, and suppression pool level; (4) Radiation monitoring system: Reactor coolant radioactivity level, primary containment radiation level, condenser off-gas radiation level, effluent radiation monitor, and process radiation levels; and (5) Meteorological data: Wind speed, wind direction, and atmospheric stability. Table 4.14-1 provides a typical listing of parameters transmitted by ERDS for BWRs.

4.14.2.5 Valid Actuation

Valid ESF actuations are those actuations that result from "valid signals" or from intentional manual initiation, unless it is part of a preplanned test. Valid signals are those signals that are initiated in response to actual plant conditions or parameters satisfying the requirements for initiation of the safety function of the system. Invalid actuations are, by definition, those that do not meet the criteria for being valid. In other words a valid actuation is one that occurs as a result of the measured process parameter exceeding its setpoint. An example of a valid actuation would be when an emergency diesel starts on an actual undervoltage on the safety bus. An invalid actuation would be if the same diesel started due to a failure of a relay and no actual undervoltage on the safety bus was present. Another example of a valid actuation of RPS is when actual reactor power exceeded the APRM setpoint, whereas an invalid actuation would be spiking of an APRM with another APRM in trip (and no actual high flux existed).

Except for critical scrams, invalid actuations are not reportable by telephone under 10CFR50.72. In addition, invalid actuations are not reportable under 10CFR50.73 in any of the following circumstances:

(A) The invalid actuation occurred when the system is already properly removed from service. This means all requirements of plant procedures for removing equipment from service have been met. It includes required clearance documentation, equipment and control board tagging, and properly positioned valves and power supply breakers.

(B) The invalid actuation occurred after the safety function has already been completed. An example would be RPS actuation after the control rods have already been inserted into the core.

If an invalid ESF actuation reveals a defect in the ESF system so the system failed or would fail to perform its intended function, the event continues to be reportable under other requirements of 10CFR50.72 and 50.73. When invalid ESF actuations

excluded by the conditions described above occur as part of a reportable event, they should be described as part of the reportable event, in order to provide a complete, accurate and thorough description of the event

4.14.3 Immediate Reports

10 CFR 50.72 requires telephone reports to be made to the Headquarters Operations Officer (HOO) via the Emergency Notification System for specific events and conditions where immediate NRC action may be required or the NRC needs timely information to respond to heightened public concern.

The non-emergency reports contain a time requirement for reporting. Specifically, these reports are made as soon as practical and in all cases within one, four or eight hours of **occurrence** of the event that meets the criteria of the regulation as clarified in NUREG 1022.

Licensees typically implement this regulation using an administrative procedure which lists the reporting criteria and assigns responsibility for reporting with the Shift Manager. In general, if it is not clear if the event meets the criteria for reporting, the on-shift personnel will make the report. If a licensee makes a 10 CFR 50.72 ENS notification and later determines that the event or condition was not reportable, the licensee should call the NRC Operations Center on the ENS telephone to retract the notification and explain the rationale for that decision. There is no set time limit for ENS telephone retractions. However, since most retractions occur following completion of engineering and/or management review, it is expected that retractions would occur shortly after such review.

Although not required under the regulation, the NRC has provided an ENS Event Notification Worksheet (NRC Form 361) which provides the usual order of questions and discussion for easier communication and its use often enables a licensee to prepare answers for a more clear and complete notification. Table 4.14-2 is a copy of the form. Licensees may obtain an event number and notification time from the HOO when the ENS notification is made.

Clear, complete and accurate ENS notification helps the HOO to understand the safety significance of the event. Licensees should use proper names for systems and components, as well as their alphanumeric identifications during ENS notifications. Licensees should avoid using local jargon for plant components, areas, operations, and the like so that the HOO can quickly understand the situation and have fewer questions and others not familiar with the plant can more readily understand the situation.

Specific reporting criteria are discussed below.

4.14.3.1 Emergency Reports

The licensee shall notify the NRC **immediately** after notification of the appropriate state or local agencies and **not later than one hour** after the time the licensee declares one of the Emergency Classes. Time frames specified for notification in 10 CFR 50.72(a) use the words "immediately" and "not later than one hour" to ensure the Commission can fulfill its responsibilities during and following the most serious events. Followup notifications for changes in emergency level or effectiveness of actions are discussed later in this chapter.

Occasionally, a licensee discovers that a condition existed which met the emergency plan criteria but no emergency was declared and the basis for the emergency class no longer exists at the time of this discovery. This may be due to a rapidly concluded event or an oversight in the emergency classification made during the event or it may be determined during a post-event review. Frequently, in cases of this nature, which were discovered after the fact, licensees have declared the emergency class, immediately terminated the emergency class and then made the appropriate notifications. However, the NRC staff does not consider actual declaration of the emergency class to be necessary in these circumstances; an ENS notification within one hour of the discovery of the undeclared (or miss-classified) event provides an acceptable alternative.

4.14.3.2 One-Hour Non-Emergency Report

4.14.3.2.1 Licensee Invokes 10CFR50.54(x

If not reported as a declaration of an Emergency, the licensee shall notify the NRC as soon as practical and in all cases within one hour of the occurrence of any deviation from the plant's Technical Specifications authorized pursuant to 10 CFR 50.54(x). 10 CFR 50.54(x) allows a licensee to take reasonable action that departs from a license condition or a technical specification in an emergency when this action is immediately needed to protect the public health and safety and no action consistent with license conditions and technical specifications that can provide adequate or equivalent protection is immediately apparent. The decision to invoke 10 CFR 50.54(x) must be approved by a licensed senior reactor operator.

Although rarely required, 10CFR50.54(x) has been used to suspend portions of the station’s security plan during hurricanes and to reduce the fire brigade below required staffing levels to allow the brigade to respond to an offsite fire.

4.14.3.3 Four-Hour Non-Emergency Reports

4.14.3.3.1 Initiation of Shutdown Required by Technical Specifications

This reporting requirement is intended to capture those events for which TS require the initiation of reactor shutdown to provide the NRC with early warning of safety significant conditions serious enough to warrant that the plant be shut down. The phrase "initiation of any nuclear plant shutdown" includes action to start reducing reactor power (i.e., adding negative reactivity) and does not include mode changes required by TS if initiated after the plant is already in a shutdown condition.

The corresponding requirement for a written report under 10 CFR 50.73 is the completion of a shutdown required by TS.

4.14.3.3.2 ECCS Discharge into the RCS

Licensees are required to report any event that results or should have resulted in emergency core cooling system (ECCS) discharge into the reactor coolant system as a result of a **valid** signal except when the actuation results from and is part of a pre-planned sequence during testing or reactor operation. This includes both automatic and manual actuation.

One example would be if HPCI actuated and injected into the RCS on a Level 2 signal following a scram.

4.14.3.3.3 RPS Actuation while Critical

Licensees are required to report any event or condition that results in actuation of the reactor protection system (RPS) when the reactor is critical except when the actuation results from and is part of a pre-planned sequence during testing or reactor operation. Again this applies to both manual and automatic actuations, but **it does not necessarily require a valid actuation**.

4.14.3.3.4 News Release or Notification to Other Government Agency

Licensees are required to report any event or situation, related to the health and safety of the public or on-site personnel, or protection of the environment, for which a news release is planned or notification to other government agencies has been or will be made. Such an event may include an on-site fatality or inadvertent release of radioactively contaminated materials.

The purpose of this criterion is to ensure the NRC is made aware of issues that will cause heightened public or government concern related to the radiological health and

safety of the public or on-site personnel or protection of the environment. For the case of an event for which a news release is planned, the purpose of the report is to provide timely and accurate information so the NRC can respond to heightened public concern. Accordingly, it makes sense to provide the report prior to the time the news release is issued.

Licensees typically issue press releases or notify local, county, State or Federal agencies on a wide range of topics that are of interest to the general public. The NRC Operations Center does not need to be made aware of every press release made by a licensee. Licensees generally do not have to report media and government interactions unless they are related to the radiological health and safety of the public or onsite personnel, or protection of the environment.

For example, the NRC does not generally need to be informed under this criterion of:

- minor deviations from sewage or chlorine effluent limits
- minor non-radioactive, onsite chemical spills
- minor oil spills
- problems with plant stack or water tower aviation lighting
- peaceful demonstrations
- routine reports of effluent releases to other agencies
- releases of water from dams associated with the plant

Since the purpose of this type of report is to make the NRC aware of breaking issues, an LER is not required to be submitted as a result (unless it meets some other criteria for reporting).

4.14.3.4 Eight-Hour Non-Emergency Report

4.14.3.4.1 Serious Degradation of Safety Barriers or Unanalyzed Condition

Licensees are required to report any event or condition that results in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded; or the nuclear power plant being in an unanalyzed condition that significantly degrades plant safety.

For the criteria of a nuclear power plant, including its principal safety barriers, being seriously degraded, applies to material (e.g., metallurgical or chemical) problems that cause abnormal degradation of or stress upon the principal safety barriers (i.e., the fuel cladding, reactor coolant system pressure boundary, or the containment). Examples include:

- Fuel cladding failures in the reactor, or in the storage pool, that exceed expected values, or that are unique or widespread, or that are caused by unexpected factors.
- Welding or material defects in the primary coolant system.
- Low temperature over pressure transients where the pressure-temperature relationship violates pressure-temperature limits.
- Loss of containment function or integrity.

For an unanalyzed condition that significantly affects plant safety, the licensee should use engineering judgment and experience to determine whether an unanalyzed condition existed. It is not intended that this paragraph apply to minor variations in individual parameters, or to problems concerning single pieces of equipment. For example, small voids in systems designed to remove heat from the reactor core which has been previously shown through analysis not to be safety significant need not be reported. However, the accumulation of voids that could inhibit the ability to adequately remove heat from the reactor core would constitute an unanalyzed condition and would be reportable. Another example would be if fire barriers are found to be missing, such that the required degree of separation for redundant safe shutdown trains is lacking, the event would be reportable as an unanalyzed condition that significantly degraded plant safety. On the other hand, if a fire wrap, to which the licensee has committed, is missing from a safe shutdown train but another safe shutdown train is available in a different fire area, was protected such that the required separation for safe shutdown trains is still provided, the event would not be reportable.

4.14.3.4.2 Valid Safety System Actuations

Licensees are required to report any event or condition that results in **valid** actuation of specific systems listed except when the actuation results from and is part of a pre-planned sequence during testing or reactor operation. The systems listed include:

- RPS
- Containment isolation signals affecting containment isolation valves in more than one system or multiple main steam isolation valves (MSIVs).
- Emergency core cooling systems including high-pressure and low-pressure core spray systems; high-pressure coolant injection system; low pressure injection function of the residual heat removal system.
- Reactor core isolation cooling system; isolation condenser system; and feedwater coolant injection system.
- Containment heat removal and depressurization systems, including containment spray and fan cooler systems.
- Emergency ac electrical power systems, including: emergency diesel generators (EDGs); and BWR dedicated Division 3 EDGs.

This criterion requires events to be reported whenever one of the specified systems actuates either manually or automatically. It is based on the premise that these systems are provided to mitigate the consequences of a significant event and, therefore: (1) they should work properly when called upon, and (2) they should not be challenged frequently or unnecessarily. The Commission is interested both in events where a system was needed to mitigate the consequences of an event (whether or not the equipment performed properly) and events where a system actuated unnecessarily.

The intent is to require reporting actuation of systems that mitigate the consequences of significant events. Usually, the staff would not consider this to include single component actuations because single components of complex systems, by themselves, usually do not mitigate the consequences of significant events. Single trains do mitigate the consequences of events, and, thus, train level actuations are reportable. This includes actuation of a diesel-generator which is considered to be an actuation of a train, not actuation of a single component.

4.14.3.4.3 Loss of Safety Function

Licensees are required to report any event or condition that at the time of discovery could have prevented the fulfillment of the safety function of structures or systems that are needed to: (A) Shut down the reactor and maintain it in a safe shutdown condition; (B) Remove residual heat; (C) Control the release of radioactive material; or (D) Mitigate the consequences of an accident. However, individual component failures need not be reported if redundant equipment in the same system was operable and available to perform the required safety function.

The level of judgment for reporting an event or condition under this criterion is a reasonable expectation of preventing fulfillment of a safety function. The intent of these criteria is to capture those events where there would have been a failure of a safety system to properly complete a safety function, regardless of whether there was an actual demand. For example, if the core spray system (both trains) failed, the event would be reportable even if there was no demand for the system's safety function.

There are a limited number of single-train systems that perform safety functions (e.g., the High Pressure Coolant Injection System in BWRs). For such systems, loss of the single train would prevent the fulfillment of the safety function of that system and, therefore, is reportable even though the plant technical specifications may allow such a condition to exist for a limited time.

It should also be noted that the NRC uses the number of safety system function failures in the previous four quarters as one of the Performance Indicators used in the Reactor Oversight Process to monitor plant performance.

4.14.3.4.4 Transport of Potentially Contaminated Personnel Offsite

Licensees are required to report any event requiring the transport of a radioactively contaminated person to an offsite medical facility for treatment. The phrase "radioactively contaminated" refers to either radioactively contaminated clothing and/or person. If there is a potential for contamination (e.g., an initial onsite survey for radioactive contamination is required but has not been completed before transport of the person off site for medical treatment) the licensee should make an ENS notification.

As with the requirement for reporting news releases, the NRC needs to be aware of events that cause heightened public or government concern related to the radiological health and safety of the public or on-site personnel. Similar to the criterion for news releases, following the initial event there is no need for a follow-on LER.

4.14.3.4.5 Major Loss of emergency Assessment, Response Capability or Communications

Licensees are required to report any event that results in a major loss of emergency assessment capability, offsite response capability, or offsite communications capability (e.g., significant portion of control room indication, Emergency Notification System, or offsite notification system).

This reporting requirement pertains to events that would impair a licensee's ability to deal with an accident or emergency. Notifying the NRC of these events may permit the NRC to take some compensating measures and to more completely assess the consequences of such a loss should it occur during an accident or emergency.

Examples of events that this criterion is intended to cover are those in which any of the following is not available:

- Safety parameter display system (SPDS)
- Emergency response facilities (ERFs)
- Emergency communications facilities and equipment including the emergency notification system (ENS)
- Public prompt notification system including sirens
- Plant monitors necessary for accident assessment

In general, the licensee will establish specific thresholds which constitute a “major loss”. For example, a loss of only the SPDS for a short period of time need not be reported, but loss of SPDS and other assessment equipment at the same time may be reportable. Another example would be the loss of a single siren for a short time is not a major loss of offsite response capability, however the loss of a large number of sirens, other alerting systems (e.g., tone alert radios), or more importantly, the lost capability to alert a large segment of the population would warrant an immediate notification.

This criterion also includes instances where a significant natural hazard (e.g., earthquake, hurricane, tornado, flood, etc.) or other event causes evacuation routes to be impassible or other parts of the response infrastructure to be impaired to the extent that the State and local governments are rendered incapable of fulfilling their responsibilities in the emergency plan for the plant.

4.14.3.5 Followup Reports

Following the initial notification, the licensee should conduct followup notifications if there is any further degradation in the level of safety of the plant or other worsening plant conditions, including those that require the declaration of any of the Emergency Classes, if such a declaration has not been previously made, or any change from one Emergency Class to another, or a termination of the Emergency Class.

In addition, the licensee should report the results of ensuing evaluations or assessments of plant conditions, the effectiveness of response or protective measures taken, and information related to plant behavior that is not understood.

These criteria are intended to provide the NRC with timely notification when an event becomes more serious or additional information or new analyses clarify an event. They also permit the NRC to maintain a continuous communications channel because of the need for continuing followup information or because of telecommunications problems.

4.14.4 Licensee Event Reports

The purpose of licensee event reports is to identify events and problems believed to be significant and useful to the NRC's effort to identify and resolve threats to public health and safety and to determine whether further action is needed to maintain or improve reactor safety.

LERs are required to be submitted within 60 days of the discovery of a reportable event. Many reportable events are discovered when they occur. However, if the

event is discovered at some later time, the **discovery date** is when the reportability clock starts under 10 CFR 50.73.

LERs are submitted using a standard report format as described in NUREG 1022 on Form 366. Table 4.14-3 is a copy of the form. If a licensee submits a 10 CFR 50.73 LER and later determines that the event or condition was not reportable, the licensee should cancel it. Cancellations of LERs should be made by letter. The letter should state that the LER is being canceled (i.e., formally withdrawn). The bases for the cancellation should be explained so that the staff can understand and review the reasons supporting the determination.

In the case of an invalid actuation of safety systems reported under § 50.73(a)(2)(iv), other than actuation of the reactor protection system (RPS) when the reactor is critical, the licensee may, at its option, provide a telephone notification to the NRC Operations Center within 60 days after discovery of the event instead of submitting a written LER.

It should be noted that all LERs are inspected by the resident inspectors under Inspection Procedure 71153, Followup of Events and Notices of Enforcement Discretion, and formally closed out in their quarterly inspection reports.

The following sections contain a discussion on LER reporting criteria as compared with immediate notification criteria contained in 10 CFR5 0.72.

4.14.4.1 Immediate Reports Requiring an LER

A summary listing of immediate report criteria and the associated LER report criteria are provided in Table 4.14-4 and are not repeated here.

The immediate report required for the initiation of a shutdown required by Technical Specifications has a corresponding LER criterion of completion of a shutdown required by TS. Therefore, if the condition requiring the shutdown was corrected before achieving Mode 3, an LER is not required to be submitted.

4.14.4.2 Immediate Reports Not Requiring an LER

Several criteria for making immediate notifications involve informing the NRC of events which could create heightened public awareness so that the NRC is prepared to respond “real-time”. These reports generally (unless they meet some other criteria) do not require an LER since the event has passed. These criteria are listed in Table 4.14-4 and include:

- Planned news release
- Notification of other government agencies

- Transport of potentially contaminated person offsite
- Loss of emergency preparedness capability

4.14.4.3 LERs with No Corresponding Immediate Report

These criteria are also listed in Table 4.14-4. In general, these criteria either did not pose an immediate risk to public health and safety or if they had, would have been reportable under another criterion of 10 CFR 50.72.

The most frequent criteria in this category are **conditions prohibited by Technical Specifications**. Licensees are required to submit an LER for any operation or condition which was prohibited by the plant's Technical Specifications except when the Technical Specification is administrative in nature; the event consisted solely of a case of a late surveillance test where the oversight was corrected, the test was performed, and the equipment was found to be capable of performing its specified safety functions; or the Technical Specification was revised prior to discovery of the event such that the operation or condition was no longer prohibited at the time of discovery of the event.

An LER is required if a condition existed for a time longer than permitted by the technical specifications (i.e., greater than the allowed outage time) even if the condition was not discovered until after the allowable time had elapsed and the condition was rectified immediately upon discovery. For Technical Specification operability, the allowed outage time begins on discovery. For reportability, if there is firm evidence that the component was inoperable before discovery, then that is the time the allowed outage time clock starts. For example, if a diesel fails during testing and the cause was due to a faulty governor installed several months ago, the operators will declare the diesel inoperable at time of failure, but because of the firm evidence, it would have become inoperable when the governor was replaced and therefore would be reportable.

As discussed above, discrepancies found in technical specifications surveillance tests should be assumed to occur at the time of the test unless there is firm evidence, based on a review of relevant information (e.g., the equipment history and the cause of failure) to indicate that the discrepancy occurred earlier. However, the existence of similar discrepancies in multiple components is an indication that the discrepancies may well have arisen over a period of time and the failure mode should be evaluated to make this determination. For example, if several safety valves fail their lift setpoint tests during an outage, it can be assumed that at least some of the failures occurred before the outage (prior to discovery) and therefore would be reportable as a condition prohibited by Technical Specifications.

Other criteria for which an LER is required and there is no directly related immediate report include:

- Any **natural phenomenon** or other external condition that posed an **actual threat** to the safety of the nuclear power plant or significantly **hampered site personnel** in the performance of duties necessary for the safe operation of the nuclear power plant.

- Any event where a **single cause** or condition caused at least **one independent train or channel to become inoperable in multiple systems or two independent trains or channels to become inoperable in a single system** designed to:
  (A) Shut down the reactor and maintain it in a safe shutdown condition;
  (B) Remove residual heat;
  (C) Control the release of radioactive material; or
  (D) Mitigate the consequences of an accident.

- Any **airborne radioactive release** that, when averaged over a time period of 1 hour, resulted in airborne radionuclide concentrations in an unrestricted area that exceeded 20 times the applicable concentration limits specified in appendix B to part 20, table 2, column 1.

- Any **liquid effluent release** that, when averaged over a time period of 1 hour, exceeds 20 times the applicable concentrations specified in appendix B to part 20, table 2, column 2, at the point of entry into the receiving waters (i.e., unrestricted area) for all radionuclides except tritium and dissolved noble gases.

- Any event or condition that as a result of a **single cause** could have prevented the fulfillment of a safety function for **two or more trains or channels in different systems** that are needed to:
  (1) Shut down the reactor and maintain it in a safe shutdown condition;
  (2) Remove residual heat;
  (3) Control the release of radioactive material; or
  (4) Mitigate the consequences of an accident.

  However, licensees are not required to report an event pursuant this section if the event results from:
  (1) A shared dependency among trains or channels that is a natural or expected consequence of the approved plant design; or
  (2) Normal and expected wear or degradation.

- Any event that posed an actual threat to the safety of the nuclear power plant or significantly **hampered site personnel** in the performance of duties necessary for

the safe operation of the nuclear power plant including **fires, toxic gas releases, or radioactive releases**.

4.14.5 Other Event Reports Required by Regulation

There are numerous other regulations that require the licensee to notify the NRC within a specified time period following events by telephone and/or through a written report. These reporting criteria are typically listed in the same administrative procedure for 10 CFR 50.72 reports and the shift manager is response for making the reports when less than 24 hours is allowed. Although they do not necessarily require phone reports to be made on the ENS, most licensees use the system for these reports. Likewise, many of the written reports required by these regulations are submitted on the LER Form 366. A summary of these reporting requirements is provided in Table 4.14-5. The following sections provide a brief summary of some of the more common reporting criteria.

4.14.5.1 Standards for Protection against Radiation (Part 20)

10 CFR Part 20 provides regulations governing reporting of events that include **radiological exposures, contamination and releases**. A summary of the criteria is listed below:

<u>Immediate notifications</u>

- (20.1906) The licensee shall immediately notify the final delivery carrier and the NRC Operations Center (301-816-5100), by telephone, when (1) Removable radioactive surface contamination exceeds the limits or (2) External radiation levels exceed the limits
- (20.2201) Immediately after its occurrence becomes known to the licensee, any lost, stolen, or missing licensed material in an aggregate quantity equal to or greater than 1,000 times the quantity specified in appendix C to part 20 under such circumstances that it appears to the licensee that an exposure could result to persons in unrestricted areas
- (20.2202) Immediately report any event involving byproduct, source, or special nuclear material possessed by the licensee that may have caused or threatens to cause any of the following conditions
    - An individual to receive (i) A total effective dose equivalent of 25 rems or more; or (ii) A lens dose equivalent of 75 rems or more; or (iii) A shallow-dose equivalent to the skin or extremities of 250 rads or more; or
    - The release of radioactive material, inside or outside of a restricted area, so that, had an individual been present for 24 hours, the individual could have received an intake five times the annual limit on intake

Twenty-four hour notification

- (20.2202) Report any event involving loss of control of licensed material that may have caused, or threatens to cause, any of the following conditions:
  - An individual to receive, in a period of 24 hours (i) A total effective dose equivalent exceeding 5 rems; or (ii) A lens dose equivalent exceeding 15 rems; or (iii) A shallow-dose equivalent to the skin or extremities exceeding 50 rems
  - The release of radioactive material, inside or outside of a restricted area, so that, had an individual been present for 24 hours, the individual could have received an intake in excess of one occupational annual limit on intake

30 day reports

- Reports of exposures, radiation levels, and concentrations of radioactive material exceeding the constraints or limits
  (1) Any incident for which notification is required by § 20.2202; or
  (2) Doses in excess of any of the following:
    - The occupational dose limits for adults, minors, an embryo/fetus of a declared pregnant woman, an individual member of the public,
    - Any applicable limit in the license; or
    - ALARA constraints for air emissions
  (3) Levels of radiation or concentrations of radioactive material in a restricted area in excess of any applicable limit in the license; or an unrestricted area in excess of 10 times any applicable limit set forth in this part or in the license; or
- Planned special exposures
- Occurrence of any lost, stolen, or missing licensed material becomes known to the licensee, all licensed material in a quantity greater than 10 times the quantity specified in appendix C to Part 20 that is still missing at this time.

4.14.5.2 Reporting Defects and Non-Compliances (Part 21)

10 CFR Part 21 provides guidance on reporting **defects and non-compliances in parts or components** used in nuclear power plants.

It requires that any individual director or responsible officer of a firm constructing, owning, operating or supplying the components of any facility or activity who obtains information reasonably indicating that the facility, activity, or **basic component** supplied to such facility or activity contains **defects**, which could create a **substantial safety hazard**, to **immediately notify** the Commission of such failure to comply or such defect, unless he has actual knowledge that the Commission has been adequately informed of such defect or failure to comply.

Initial notification should be by facsimile, which is the preferred method of notification, to the NRC Operations Center at (301) 816 - 5151 or by telephone at (301) 816 - 5100 within **two days** following receipt of information by the director or responsible

corporate officer on the identification of a defect or a failure to comply.

Deviations and failures to comply shall be evaluated to identify defects and failures to comply associated with substantial safety hazards as soon as practicable, and, in all cases within **60 days of discovery**, in order to identify a reportable defect or failure to comply that could create a **substantial safety hazard**, were it to remain uncorrected.

A ***basic component*** means a structure, system, or component, or part thereof that affects its safety function necessary to assure:

(A) The integrity of the reactor coolant pressure boundary;
(B) The capability to shut down the reactor and maintain it in a safe shutdown condition; or
(C) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in §50.34(a)(1), §50.67(b)(2), or §100.11 of this chapter, as applicable

Substantial safety hazard means a loss of safety function to the extent that there is a major reduction in the degree of protection provided to public health and safety for any facility or activity licensed or otherwise approved or regulated by the NRC

Defect means:

(1) A deviation in a basic component delivered to a purchaser for use in a facility or an activity subject to the regulations in this part if, on the basis of an evaluation, the deviation could create a **substantial safety hazard**;
(2) The installation, use, or operation of a basic component containing a defect;
(3) A deviation in a portion of a facility provided the deviation could, on the basis of an evaluation, create a **substantial safety hazard** and the portion of the facility containing the deviation has been offered to the purchaser for acceptance;
(4) A condition or circumstance involving a basic component that could contribute to the **exceeding of a safety limit**; or
(5) An error, omission or other circumstance in a design certification, or standard design approval that, on the basis of an evaluation, could create a **substantial safety hazard**.

Although reports made under Part 21 typically originate from the suppliers of components or services, licensees are required to evaluate such defects and ensure they are reported if they meet the requirements for reporting.

4.14.5.3 Fitness for Duty Programs (Part 26)

10 CFR Part 26 provides guidance on reporting deficiencies in and violations of the licensee's fitness for duty (FFD) program. FFD program ensures that individuals are free from the influence of alcohol or drug and are not overly fatigued. Some aspects

apply to all individuals with unescorted access whereas others only to those employees that perform safety related tasks. A summary of reporting criteria in Part 26 follows.

24-hour Reports

(1) The use, sale, distribution, possession, or presence of illegal drugs, or the consumption or presence of alcohol within a protected area;
(2) Any acts by any person licensed under 10 CFR parts 52 and/or 55 to operate a power reactor (i.e. licensed operators), if such acts:
    a. Involve the use, sale, or possession of a controlled substance;
    b. Result in a determination that the individual has violated the licensee's or other entity's FFD policy (including subversion); or
    c. Involve the consumption of alcohol within a protected area or while performing the duties that require the individual to be subject to the FFD program;
(3) Any intentional act that casts doubt on the integrity of the FFD program; and
(4) Any programmatic failure, degradation, or discovered vulnerability of the FFD program that may permit undetected drug or alcohol use or abuse by individuals within a protected area, or by individuals who are assigned to perform duties that require them to be subject to the FFD program.
(5) false positive error occurs on a blind performance test sample submitted to an HHS-certified laboratory
(6) false negative error occurs on a quality assurance check of validity screening tests

30 Day Report

Testing errors or unsatisfactory performance discovered in performance testing at either a licensee testing facility or an HHS-certified laboratory, in the testing of quality control or actual specimens, or through the processing of reviews and MRO reviews, as well as any other errors or matters that could adversely reflect on the integrity of the random selection or testing process.

4.14.5.4 Completeness and Accuracy of Information (10 CFR 50.9)

10 CFR 50.9 requires that information provided to the Commission by a licensee or information required by statute or by the Commission's regulations, orders, or license conditions to be maintained by the applicant or the licensee shall be **complete and accurate** in all material respects.

If the licensee identifies information that was submitted that was not complete and/or accurate and it has a significant implication for public health and safety or common defense and security, the licensee is required to notify the Administrator of the appropriate Regional Office within **two working days** of identifying the information.

An example of when this report is required would be if a licensee identifies that information provided to the NRC in a license amendment on which the NRC approval was based, was later found to be inaccurate. The licensee would not violate 10 CFR 50.9 if they notify the regional administrator within two days of discovering that inaccurate information had been submitted. Otherwise, the NRC could pursue traditional enforcement on the violation of 10 CFR 50.9.

4.14.5.5 Technical Specifications (10 CFR 50.36)

10 CFR 50.36 provides guidance on a facility's **Technical Specifications** which include safety limits, limiting safety system settings and limiting conditions for operation. Should the facility violate any of the requirements, it also requires that the licensee notify the Commission, review the matter, and record the results of the review, including the cause of the condition and the basis for corrective action taken to preclude recurrence. In each instance it requires the licensee to notify the Commission as required by § 50.72 and submit a Licensee Event Report to the Commission as required by § 50.73. In addition, if any safety limit is exceeded, the reactor must be shut down. Operation must not be resumed until authorized by the Commission.

4.14.5.6 Acceptance Criteria for Emergency Core Cooling Systems for Light Water Reactors (10 CFR 50.46)

10 CFR 50.46 contains reporting criteria for changes to or errors found in emergency core cooling system **(ECCS) analysis**. It requires that each licensee perform an analysis to demonstrate that the ECCS is designed so that its calculated cooling performance following postulated loss-of-coolant accidents conforms to the criteria set forth below:

- *Peak cladding temperature*. The calculated maximum fuel element cladding temperature shall not exceed 2200º F.

- *Maximum cladding oxidation*. The calculated total oxidation of the cladding shall nowhere exceed 0.17 times the total cladding thickness before oxidation.

- *Maximum hydrogen generation*. The calculated total amount of hydrogen generated from the chemical reaction of the cladding with water or steam shall not exceed 0.01 times the hypothetical amount that would be generated if all of the metal in the cladding cylinders surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react.

- *Coolable geometry*. Calculated changes in core geometry shall be such that the core remains amenable to cooling.

- *Long-term cooling*. After any calculated successful initial operation of the ECCS, the calculated core temperature shall be maintained at an acceptably low value and decay heat shall be removed for the extended period of time required by the long-lived radioactivity remaining in the core.

For each change to or error discovered in an acceptable evaluation model or in the application of such a model that affects the temperature calculation, the applicant or holder of an operating license shall report the nature of the change or error and its estimated effect on the limiting ECCS analysis to the Commission at least **annually**.

If the change or error is significant, the applicant or licensee shall provide this report within **30 days** and include with the report a proposed schedule for providing a reanalysis or taking other action as may be needed to show compliance with § 50.46 requirements.

Any change or error correction that results in a calculated ECCS performance that does not conform to the ECCS acceptance criteria is a reportable event as described in § **50.72, and 50.73**. The affected applicant or licensee shall propose immediate steps to demonstrate compliance or bring plant design or operation into compliance with § 50.46 requirements.

4.14.5.7 Licensing Requirements for ISFSI (Part 72)

Part 72 establishes requirements, procedures, and criteria for the issuance of licenses to receive, transfer, and possess power reactor spent fuel, power reactor-related Greater than Class C (GTCC) waste, and other radioactive materials associated with spent fuel storage in an **independent spent fuel storage installation (ISFSI)** and the terms and conditions under which the Commission will issue these licenses. It contains a specific section reporting criteria for accidental criticality or loss of special nuclear material (10 CFR 72.74) and other reports analogous to reporting requirements of 10CFR50.72 and 50.73 (10 CFR 72.75). A summary of the reporting criteria are provided below:

<u>One Hour Report (72.74)</u>
Each licensee shall notify the NRC Operations Center within one hour of discovery of accidental criticality or any loss of special nuclear material.

<u>Emergency notifications</u>:
Each licensee shall notify the NRC Headquarters Operations Center upon the declaration of an emergency as specified in the licensee's approved emergency plan.

The licensee shall notify the NRC immediately after notification of the appropriate State or local agencies, but not later than one hour after the time the licensee declares an emergency.

Four-hour Non-Emergency Notifications:

(1) An action taken in an emergency that departs from a condition or a technical specification contained in a license or certificate of compliance issued under this part when the action is immediately needed to protect the public health and safety, and no action consistent with license or certificate of compliance conditions or technical specifications that can provide adequate or equivalent protection is immediately apparent. (Equivalent to 50.54(x)

(2) Any event or situation related to the health and safety of the public or onsite personnel, or protection of the environment, for which a news release is planned or notification to other Government agencies has been or will be made. Such an event may include an onsite fatality or inadvertent release of radioactively contaminated materials. (Written Report not required)

Eight-hour Non-Emergency Notifications:

(1) A defect in any spent fuel structure, system, or component that is important to safety.

(2) A significant reduction in the effectiveness of any spent fuel storage confinement system during use.

(3) Any event requiring the transport of a radioactively contaminated person to an offsite medical facility for treatment. (Witten report not required).

24-hour Non-Emergency Notifications:

An event in which important to safety equipment is disabled or fails to function as designed when (equivalent to safety system functional failure):

- The equipment is required by regulation, license condition, or certificate of compliance to be available and operable to prevent releases that could exceed regulatory limits, to prevent exposures to radiation or radioactive materials that could exceed regulatory limits, or to mitigate the consequences of an accident; and
- No redundant equipment was available and operable to perform the required safety function

Follow-up Notification:

With respect to the telephone notifications, in addition to making the required initial notification, each licensee shall during the course of the event:

(1) Immediately report any further degradation in the level of safety of the ISFSI or other worsening conditions, including those that require the declaration of any of

the Emergency Classes, if such a declaration has not been previously made; or any change from one Emergency Class to another; or a termination of the Emergency Class.

(2) Immediately report the results of ensuing evaluations or assessments of ISFSI or MRS conditions; the effectiveness of response or protective measures taken; and information related to ISFSI behavior that is not understood.

(3) Maintain an open, continuous communication channel with the NRC Headquarters Operations Center upon request by the NRC.

60 Day Written Reports

Each licensee who makes an initial notification described above (except as noted) shall also submit a written follow-up report to the Commission within 60 days of the initial notification (equivalent to 10 CFR 50.73).

4.14.5.8 Physical Protection of Plants and Materials (Part 73)

Part 73 prescribes requirements for the establishment and maintenance of a **physical protection** system which will have capabilities for the protection of special nuclear material at fixed sites and in transit and of plants in which special nuclear material is used. Similar to Part 72, it contains a specific section on reportability (10 CFR 73.71). A summary of the reporting criteria is listed below.

One-hour Notifications, (followed by a written report within 60 days)

(a) Any event in which there is reason to believe that a person has committed or caused, or attempted to commit or cause, or has made a credible threat to commit or cause:
  (1) A theft or unlawful diversion of special nuclear material; or
  (2) Significant physical damage to a power reactor or any facility possessing SSNM or its equipment or carrier equipment transporting nuclear fuel or spent nuclear fuel, or to the nuclear fuel or spent nuclear fuel a facility or carrier possesses; or
  (3) Interruption of normal operation of a licensed nuclear power reactor through the unauthorized use of or tampering with its machinery, components, or controls including the security system.

(b) An actual entry of an unauthorized person into a protected area, material access area, controlled access area, vital area, or transport.

(c) Any failure, degradation, or the discovered vulnerability in a safeguard system that could allow unauthorized or undetected access to a protected area, material

access area, controlled access area, vital area, or transport for which compensatory measures have not been employed.

(d) The actual or attempted introduction of contraband into a protected area, material access area, vital area, or transport.

4.14.6 Summary

The purpose of the requiring licensees to report certain events is to help fulfill the NRC mission by aiding emergency response and providing feedback of operating experience into plant operations. NUREG 1022 provides clarification on the reporting regulations for immediate reports and licensee event reports.

Immediate reports made under 10 CFR 50.72 provide immediate reporting of significant events where: (1) immediate NRC action may be required to protect the public health and safety, or (2) the NRC needs timely, accurate information to respond to heightened public concern. These reports are made to the Headquarters Operations Officer (HOO) using the Emergency Notification System. Emergency Response Data System is used during an emergency declaration of Alert or above, to transmit data directly from the licensee to the NRC to aid in monitoring and response.

Licensee event reports required by 10 CFR 50.73 describe events and problems believed to be significant and useful to the NRC's effort to identify and resolve threats to public health and safety.

There are other reports required by regulation which are needed to ensure the NRC can respond to events or conditions that could threaten the health and safety of the public. These events include radiological events, safeguards events and identification of basic component defects that pose a substantial safety hazard.

4.14.7 References

- NUREG 1022, Event Reporting Guidelines, 10 CFR 50.72 and 50.73
- 10 CFR Part 20, Standards for Protection Against Radiation
- 10 CFR Part 21, Reporting Defects and Non-Compliances
- 10 CFR Part 26, Fitness for Duty Programs
- 10 CFR 50.9, Completeness and Accuracy of Information
- 10 CFR 50.36, Technical Specifications
- 10 CFR 50.46, Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors
- 10 CFR 50.72, Immediate notification requirements for operating nuclear power reactors
- 10 CFR 50.73, Licensee event report system

- 10 CFR Part 72, Licensing requirements for the independent storage of spent nuclear fuel and high-level radioactive waste, and reactor related greater than Class C waste
- 10 CFR Part 73, Physical Protection of Plants and Materials

Table 4.14-1 Typical ERDS Data Points

Browns Ferry Unit 1 - ERDS Data Point Library

ERDS PNT No	NRC ERDS PARAMETER	POINT ID	PLANT SPECIFIC POINT DESCRIPTION
1	NI POWER RNG	SPDS0001	RX POWER APRM - COMPOSED
2	NI INTER RNG	CALC045	AVERAGE OF 8 IRM'S
3	NI SOURC RNG	SPDS0041	RX POWER SRM - AVG
4	REAC VES LEV	SPDS0007	RX WATER LEVEL - COMPOSED
5	MAIN FD FLOW	CALC040	RFW FLOW TO REACTOR
6	RCIC FLOW	71-36	RCIC PUMP DISCHARGE FLOW
7	RCS PRESSURE	SPDS0008	RX PRESSURE - COMPOSED
8	HPCI FLOW	73-33	HPCI PUMP DISCHARGE FLOW
9	LPCI FLOW	74-50	RHR SYS I FLOW
10	LPCI FLOW	74-64	RHR SYS II FLOW
11	CR SPRAY FL	75-21	CORE SPRAY SYS I FLOW
12	CR SPRAY FL	75-49	CORE SPRAY SYS II FLOW
13	CND A/E RAD	SPDS0047	OFFGAS POST TREATMENT AVG
14	CND A/E RAD	90-157	OFFGAS PRE TREATMENT AVG
15	DW RAD	90-272A	DW RAD-RX 582,45 DEG AZIMUTH
16	DW RAD	90-273A	DW RAD-RX 560, 270 DEG AZIMUTH
17	MN STEAM RAD	90-136	MAIN STM LINE A RAD LEVEL
18	MN STEAM RAD	90-137	MAIN STM LINE C RAD LEVEL
19	MN STEAM RAD	90-138	MAIN STM LINE B RAD LEVEL
20	MN STEAM RAD	90-139	MAIN STM LINE D RAD LEVEL
21	DW PRESS	SPDS0009	DRYWELL PRESSURE - COMPOSED
22	DW TEMP	SPDS0010	DRYWELL TEMPERATURE-COMPOSED
23	SPTEMP	SPDS0016	SUPPR PL WTR TEMP - COMPOSED
24	SP LEVEL	SPDS001 3	SUPPR PL WTR LVL (IN) - COMPOSED
25	H2 CONC	76-39	DRYWELL H2 CONCENTRATION
26	02 CONC	76-43	DRYWELL OXYGEN CONCENTRATION
27	CST LEVEL	2-169	CONDENSATE STORAGE TANK #1 LEVEL
28	WIND SPEED	MET005	91M AVERAGE WIND SPEED (15 MIN AVG)
29	WIND SPEED	MET013	46M AVERAGE WIND SPEED (15 MIN AVG)
30	WIND SPEED	MET021	10M AVERAGE WIND SPEED (15 MIN AVG)
31	WIND DIR	MET003	91 M VECTOR WIND DIR (15 MIN AVG)
32	WIND DIR	MET011	46M VECTOR WIND DIR (15 MIN AVG)
33	WIND DIR	MET019	1OM VECTOR WIND DIR (15 MIN AVG)
34	STAB CLASS	MET035	STACK LVL ATM STAB CLASS (15 MIN)
35	STAB CLASS	MET037	OVERALL ATM STAB CLASS (15 MIN)
36	STAB CLASS	MET039	GRND LVL ATM STAB CLASS (15 MIN)
37	TYPEDATA	REAL/ SIMULATED	INDICATES IF DATA IS FROM THE UNIT OR SIMULATOR.
38	EFF GAS RAD	SPDS0024	STACK RELEASE RATE - COMPOSED

Table 4.14-2 ENS Worksheet

PAGE 1 OF 2

NRC FORM 361
(12-2000)

U.S. NUCLEAR REGULATORY COMMISSION
OPERATIONS CENTER

REACTOR PLANT
EVENT NOTIFICATION WORKSHEET

EN #

NRC OPERATION TELEPHONE NUMBER: PRIMARY -- 301-816-5100 or 800-532-3469*, BACKUPS -- [1st] 301-951-0550 or 800-449-3694*, [2nd] 301-415-0550 and [3rd] 301-415-0553 *Licensees who maintain their own ETS are provided these telephone numbers.

NOTIFICATION TIME	FACILITY OR ORGANIZATION	UNIT	NAME OF CALLER	CALL BACK #

EVENT TIME & ZONE	EVENT DATE	POWER/MODE BEFORE	POWER/MODE AFTER

EVENT CLASSIFICATIONS

	GENERAL EMERGENCY	GEN/AAEC
	SITE AREA EMERGENCY	SIT/AAEC
	ALERT	ALE/AAEC
	UNUSUAL EVENT	UNU/AAEC
	50.72 NON-EMERGENCY	(see next columns)
	PHYSICAL SECURITY (73.71)	DDDD
	MATERIAL/EXPOSURE	B???
	FITNESS FOR DUTY	HFIT
	OTHER UNSPECIFIED REQMT.	(see last column)
	INFORMATION ONLY	NNF

1-Hr. Non-Emergency 10 CFR 50.72(b)(1)

		TS Deviation	ADEV

4-Hr. Non-Emergency 10 CFR 50.72(b)(2)

	(i)	TS Required S/D	ASHU
	(iv)(A)	ECCS Discharge to RCS	ACCS
	(iv)(B)	RPS Actuation (scram)	ARPS
	(xi)	Offsite Notification	APRE

8-Hr. Non-Emergency 10 CFR 50.72(b)(3)

	(ii)(A)	Degraded Condition	ADEG
	(ii)(B)	Unanalyzed Condition	AUNA
	(iv)(A)	Specified System Actuation	AESF
	(v)(A)	Safe S/D Capability	AINA
	(v)(B)	RHR Capability	AINB
	(v)(C)	Control of Rad Release	AINC
	(v)(D)	Accident Mitigation	AIND
	(xii)	Offsite Medical	AMED
	(xiii)	Loss Comm/Asmt/Resp	ACOM

60-Day Optional 10 CFR 50.73(a)(1)

	Invalid Specified System Actuation	AINV

Other Unspecified Requirement (Identify)

	NONR
	NONR

DESCRIPTION

Include: Systems affected, actuations and their initiating signals, causes, effect of event on plant, actions taken or planned, etc. *(Continue on back)*

NOTIFICATIONS	YES	NO	WILL BE
NRC RESIDENT			
STATE(s)			
LOCAL			
OTHER GOV AGENCIES			
MEDIA/PRESS RELEASE			

ANYTHING UNUSUAL OR NOT UNDERSTOOD? ☐ YES (Explain above) ☐ NO

DID ALL SYSTEMS FUNCTION AS REQUIRED? ☐ YES ☐ NO (Explain above)

MODE OF OPERATION UNTIL CORRECTED:

ESTIMATED RESTART DATE:

ADDITIONAL INFO ON BACK ☐ YES ☐ NO

NRC FORM 361 (12-2000)

Table 4.14-2 ENS Worksheet (continued)

ADDITIONAL INFORMATION — PAGE 2 OF 2

RADIOLOGICAL RELEASES: CHECK OR FILL IN APPLICABLE ITEMS ***(specific details/explanations should be covered in event description)***

☐ LIQUID RELEASE	☐ GASEOUS RELEASE	☐ UNPLANNED RELEASE	☐ PLANNED RELEASE	☐ ONGOING	☐ TERMINATED
☐ MONITORED	☐ UNMONITORED	☐ OFFSITE RELEASE	☐ T. S. EXCEEDED	☐ RM ALARMS	☐ AREAS EVACUATED
☐ PERSONNEL EXPOSED OR CONTAMINATED		☐ OFFSITE PROTECTIVE ACTIONS RECOMMENDED		*State release path in description	

	Release Rate (Ci/sec)	% T. S. LIMIT	HOO GUIDE	Total Activity (Ci)	% T. S. LIMIT	HOO GUIDE
Noble Gas			0.1 Ci/sec			1000 Ci
Iodine			10 uCi/sec			0.01 Ci
Particulate			1 uCi/sec			1 mCi
Liquid *(excluding tritium and dissolved noble gases)*			10 uCi/min			0.1 Ci
Liquid (tritium)			0.2 Ci/min			5 Ci
Total Activity						

	PLANT STACK	CONDENSER/AIR EJECTOR	MAIN STEAM LINE	SG BLOWDOWN	OTHER
RAD MONITOR READINGS					
ALARM SETPOINTS					
% T. S. LIMIT *(if applicable)*					

RCS OR SG TUBE LEAKS: CHECK OR FILL IN APPLICABLE ITEMS: ***(specific details/explanations should be covered in event description)***

LOCATION OF THE LEAK *(e.g., SG #, valve, pipe, etc.)*

LEAK RATE	UNITS: gpm/gpd	T. S. LIMITS	SUDDEN OR LONG-TERM DEVELOPMENT

LEAK START DATE	TIME	COOLANT ACTIVITY AND UNITS:	PRIMARY	SECONDARY

LIST OF SAFETY RELATED EQUIPMENT NOT OPERATIONAL

EVENT DESCRIPTION *(Continued from front)*

Table 4.14-3 LER Form 366

NRC FORM 366 (10-2010) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
	05000	1 OF

4. TITLE

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
				-	-					05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

10. POWER LEVEL

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER *(Include Area Code)*

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☐ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

NRC FORM 366 (10-2010)

Table 4.14-4 Summary of 50.72 and 50.73 Reporting Criteria

Immediate Report Criteria Under §50.72	LER Criteria Under § 50.73
Emergency Report	
§ 50.72(a)(1)(i) The declaration of any of the Emergency Classes specified in the licensee's approved Emergency Plan.	*No direct LER criteria*
One-Hour Non-Emergency	
§ 50.72(b)(1) Any deviation from the plant's Technical Specifications authorized pursuant to § 50.54(x) of this part.	**§ 50.73(a)(2)(i)(C)** Any deviation from the plant's Technical Specifications authorized pursuant to § 50.54(x) of this part.
Four-Hour Non-Emergency	
§ 50.72(b)(2)(i) The initiation of any nuclear plant shutdown required by the plant's Technical Specifications.	**§ 50.73(a)(2)(i)(A)** The completion of any nuclear plant shutdown required by the plant's Technical Specifications.
§ 50.72(b)(2)(iv)(A) Any event that results or should have resulted in emergency core cooling system (ECCS) discharge into the reactor coolant system as a result of a **valid** signal except when the actuation results from and is part of a pre-planned sequence during testing or reactor operation.	*LER may be required if manual or automatic actuation of safety system per § 50.73(a)(2)(iv)(A)*
§ 50.72(b)(2)(iv)(B) Any event or condition that results in actuation of the reactor protection system (RPS) when the reactor is critical except when the actuation results from and is part of a pre-planned sequence during testing or reactor operation.	*LER may be required if manual or automatic actuation of safety system per § 50.73(a)(2)(iv)(A)*
§ 50.72(b)(2)(xi) Any event or situation, related to the health and safety of the public or onsite personnel, or protection of the environment, for which a news release is planned or notification to other government agencies has been or will be made. Such an event may include an onsite fatality or inadvertent release of radioactively contaminated materials.	None
Eight-Hour Non-Emergency	
§ 50.72(b)(3)(ii) Any event or condition that results in: **(A)** The condition of the nuclear power plant, including its principal safety barriers, being seriously degraded; or **(B)** The nuclear power plant being in an unanalyzed condition that significantly degrades plant safety.	**§ 50.73(a)(2)(ii)** Any event or condition that resulted in: **(A)** The condition of the nuclear power plant, including its principal safety barriers, being seriously degraded; or **(B)** The nuclear power plant being in an unanalyzed condition that significantly degraded plant safety.

Table 4.14-4 Summary of 50.72 and 50.73 Reporting Criteria (Cont.)

Immediate Report Criteria Under §50.72	LER Criteria Under § 50.73
Eight-Hour Non-Emergency (Cont.)	
§ 50.72(b)(3)(iv)(A) Any event or condition that results in **valid** actuation of any of the systems listed below, except when the actuation results from and is part of a pre-planned sequence during testing or reactor operation. *(1)* Reactor protection system (RPS) *(2)* General containment isolation signals affecting containment isolation valves in more than one system or multiple main steam isolation valves (MSIVs). *(4)* ECCS including: HPCS, LPCS, HPCI and LPCI *(5) RCIC*; isolation condenser system; and feedwater coolant injection system. *(7)* Containment heat removal and depressurization systems, including containment spray and fan cooler systems. *(8)* Emergency ac diesel generators (EDGs);	**§ 50.73(a)(2)(iv)(A)** Any event or condition that resulted in manual or automatic actuation of any of the systems listed below, except when: (1) The actuation resulted from and was part of a pre-planned sequence during testing or reactor operation; or (2) The actuation was **invalid** and; (i) Occurred while the system was properly removed from service; or (ii) Occurred after the safety function had been already completed. *(1)* Reactor protection system (RPS) *(2)* General containment isolation signals affecting containment isolation valves in more than one system or multiple main steam isolation valves (MSIVs). *(4)* ECCS including: HPCS, LPCS, HPCI and LPCI *(5) RCIC*; isolation condenser system; and feedwater coolant injection system. *(7)* Containment heat removal and depressurization systems, including containment spray and fan cooler systems. *(8)* Emergency ac diesel generators (EDGs); *(9)* Emergency service water systems that do not normally run and that serve as ultimate heat sinks.
§ 50.72(b)(3)(v) Any event or condition that at the time of discovery could have prevented the fulfillment of the safety function of structures or systems that are needed to: (A) Shut down the reactor and maintain it in a safe shutdown condition; (B) Remove residual heat; (C) Control the release of radioactive material; or (D) Mitigate the consequences of an accident. **§ 50.72(b)(3)(vi)** Events covered in paragraph (b)(3)(v) of this section may include one or more procedural errors, equipment failures, and/or discovery of design, analysis, fabrication, construction, and/or procedural inadequacies. However, individual component failures need not be reported if redundant equipment in the same system was operable and available to perform the required safety function.	**§ 50.73(a)(2)(v)** Any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to: (A) Shut down the reactor and maintain it in a safe shutdown condition; (B) Remove residual heat; (C) Control the release of radioactive material; or (D) Mitigate the consequences of an accident. **§ 50.73(a)(2)(vi)** Events covered in paragraph (a)(2)(v) of this section may include one or more procedural errors, equipment failures, and/or discovery of design, analysis, fabrication, construction, and/or procedural inadequacies. However, individual component failures need not be reported pursuant to paragraph (a)(2)(v) of this section if redundant equipment in the same system was operable and available to perform the required safety function.

Table 4.14-4 Summary of 50.72 and 50.73 Reporting Criteria (Cont.)

Immediate Report Criteria Under §50.72	LER Criteria Under § 50.73
Eight-Hour Non-Emergency (Cont.)	
§ 50.72(b)(3)(xii) Any event requiring the transport of a radioactively contaminated person to an offsite medical facility for treatment."	None
§ 50.72(b)(3)(xiii) "Any event that results in a major loss of emergency assessment capability, offsite response capability, or offsite communications capability (e.g., significant portion of control room indication, emergency notification system, or offsite notification system).	None
Followup ENS Notifications	
§ 50.72(c) Followup notification. With respect to the telephone notifications, in addition to making the required initial notification, each licensee, shall during the course of the event: *(1) Immediately report* (i) any further degradation in the level of safety of the plant or other worsening plant conditions, including those that require the declaration of any of the Emergency Classes, if such a declaration has not been previously made, or (ii) any change from one Emergency Class to another, or (iii) a termination of the Emergency Class. *(2) Immediately report* (i) the results of ensuing evaluations or assessments of plant conditions, (ii) the effectiveness of response or protective measures taken, and (iii) information related to plant behavior that is not understood. (3) Maintain an open, continuous communication channel with the NRC Operations Center upon request by the NRC.	N/A

Table 4.14-4 Summary of 50.72 and 50.73 Reporting Criteria (Cont.)

Immediate Report Criteria Under §50.72	LER Criteria Under § 50.73
LERs Not Associated with Immediate Notifications	
None	**§ 50.73(a)(2)(i)(B)** Any operation or condition which was prohibited by the plant's Technical Specifications except when: 1) The Technical Specification is administrative in nature; 2) The event consisted solely of a case of a late surveillance test where the oversight was corrected, the test was performed, and the equipment was found to be capable of performing its specified safety functions; or 3) The Technical Specification was revised prior to discovery of the event such that the operation or condition was no longer prohibited at the time of discovery of the event.
Maybe reportable as Emergency Declaration	**§ 50.73(a)(2)(iii)** Any natural phenomenon or other external condition that posed an actual threat to the safety of the nuclear power plant or significantly hampered site personnel in the performance of duties necessary for the safe operation of the nuclear power plant.
Maybe reportable as unanalyzed condition or safety system loss of safety function	**§ 50.73(a)(2)(vii)** Any event where a single cause or condition caused at least one independent train or channel to become inoperable in multiple systems or two independent trains or channels to become inoperable in a single system designed to: (A) Shut down the reactor and maintain it in a safe shutdown condition; (B) Remove residual heat; (C) Control the release of radioactive material; or (D) Mitigate the consequences of an accident.
No direct 50.72 equivalent although it may require a telephone notification as an Emergency Declaration or news release or under 10CFR Part 20	**§ 50.73(a)(2)(viii)(A)** Any airborne radioactive release that, when averaged over a time period of 1 hour, resulted in airborne radionuclide concentrations in an unrestricted area that exceeded 20 times the applicable concentration limits specified in appendix B to part 20, table 2, column 1. **§ 50.73(a)(2)(viii)(B)** Any liquid effluent release that, when averaged over a time period of 1 hour, exceeds 20 times the applicable concentrations specified in appendix B to part 20, table 2, column 2, at the point of entry into the receiving waters (i.e., unrestricted area) for all radionuclides except tritium and dissolved noble gases.

Table 4.14-4 Summary of 50.72 and 50.73 Reporting Criteria (Cont.)

Immediate Report Criteria Under §50.72	LER Criteria Under § 50.73
LERs Not Associated with Immediate Notifications	
Maybe reportable as unanalyzed condition or safety system loss of safety function	**§ 50.73(a)(2)(ix)(A)** Any event or condition that as a result of a single cause could have prevented the fulfillment of a safety function for two or more trains or channels in different systems that are needed to: *(1)* Shut down the reactor and maintain it in a safe shutdown condition; *(2)* Remove residual heat; *(3)* Control the release of radioactive material; or *(4)* Mitigate the consequences of an accident. **§ 50.73(a)(2)(ix)(B)** Events covered in paragraph (ix)(A) of this section may include cases of procedural error, equipment failure, and/or discovery of a design, analysis, fabrication, construction, and/or procedural inadequacy. However, licensees are not required to report an event pursuant to paragraph (ix)(A) of this section if the event results from: *(1)* A shared dependency among trains or channels that is a natural or expected consequence of the approved plant design; or *(2)* Normal and expected wear or degradation.
Maybe reportable as Emergency Declaration	**§ 50.73(a)(2)(x)** Any event that posed an actual threat to the safety of the nuclear power plant or significantly hampered site personnel in the performance of duties necessary for the safe operation of the nuclear power plant including fires, toxic gas releases, or radioactive releases.

Table 4.14-5 Summary of Other Regulatory Required Event Reports

Regulation	Title	General Subject
10 CFR Part 20	Standards for Protection Against Radiation	Radiological events including releases, exposures and contaminations
10 CFR Part 21	Reporting Defects and Non-Compliances	Defects in basic components or services used in nuclear facilities that constitute a substantial safety hazard
10 CFR Part 26	Fitness for Duty Programs	Violations of or deficiencies in a facility's fitness for duty program
10 CFR 50.9	Completeness and Accuracy of Information	Incomplete or inaccurate information contained in licensee submittals that pose a significant implication for public health and safety or common defense and security
10 CFR 50.36	Technical Specifications	Violations of TS safety limits, limiting safety system settings or limited conditions for operation
10 CFR 50.46	Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors	Change to or errors in the ECCS analysis that are significant and/or result in not meeting the ECCS acceptance criteria
10 CFR Part 72	Licensing requirements for the independent storage of spent nuclear fuel and high-level radioactive waste, and reactor related greater than Class C waste	Includes reporting criteria for events pertaining to Independent Spent Fuel Storage Installations (ISFSIs)
10 CFR Part 73	Physical Protection of Plants and Materials	Security Safeguards Events